

# Spring™ Column Hardware

## For Use with Multipacker® Packing Instruments

- High-efficiency axial compression packing mechanism
- Extend media lifetime
- Mobile Dynamic Axial Compression (DAC) column
- Easily packed by end-user with a Multipacker® instrument

The Spring™ Column hardware described in this section is designed to be used in conjunction with Multipacker® instruments. Please see page 172 for information on the Multipacker® product line.

Spring™ Column units are also available prepacked and ready-to-use. However, prepacked Spring™ Column units are not user-serviceable and must be returned to Grace for repacking, unless the customer owns a Multipacker® packing system.

### How to Order Spring™ Column Hardware for Use with Multipacker® Instruments

Spring™ Columns can be ordered as a complete kit, as seen on page 163, or customized selecting the options that best suit your needs. Components for customization can be found on page 164. Spring™ Columns are offered in two lengths, 40cm and 70cm. A 40cm column body can accommodate up to a 15cm length packed bed and the 70cm column body can accommodate up to a 30cm length packed bed.

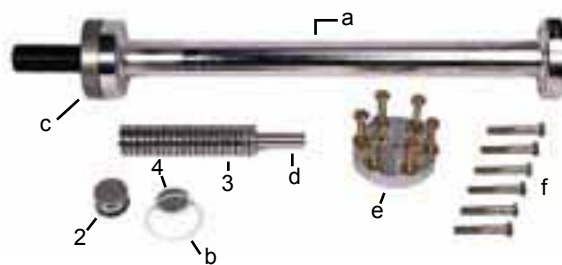
Each complete Spring™ Column assembly consists of five components. For customized columns, one of each component below needs to be ordered:

1. The Base Spring™ Column Parts Kit includes:
  - a. Column Body
  - b. All Seals and O-rings
  - c. Locking Mechanism
  - d. Guide Tube
  - e. Endplate
  - f. Assembly Hardware
  - g. Packing Spacers (for 70cm length columns)—not pictured
2. A Ready-to-Use Piston Assembly consisting of the piston body, piston frit, PTFE sleeve and O-ring. The piston assembly can be ordered with a 1µm, 2µm, or 5µm frit porosity.
3. A Spring Kit. Choose the appropriate pressure range for your needs. Spring force must exceed the operating pressure of the column in order to maintain axial compression force.
4. An Outlet Frit. Choose 1µm, 2µm, or 5µm frit porosity. For 101mm i.d. columns, the outlet frit is identical to the piston assembly (#2).
5. Tubing and Connectors. Choose tubing with an outer diameter and bore that suits your needs.

The guides on the following pages will help you select the combination of options appropriate to your needs. For further assistance, call Grace Technical Support.



### Base Spring Colum Parts Kit



### related products

Refer to page 172 for more information on the Multipacker® packing stations used to pack Spring™ Column hardware.



### technical assistance

Contact Tech Support: Phone: 1.800.255.8324  
 Email: [contact.alltech@grace.com](mailto:contact.alltech@grace.com)  
 Online: [www.discoverysciences.com](http://www.discoverysciences.com)

# Spring™ Column Hardware

## Complete Spring™ Column Hardware Kits

Complete hardware kits are available under single catalog numbers for standard 25mm i.d., 50mm i.d., and 101mm i.d. Spring™ Column units, as shown below.

Complete kits are provided with 2µm frits and 1000 to 2000psig springs. Different combinations are possible by building a custom Spring™ Column on page 164.

Individual components and replacement parts are listed on the following two pages.

### Complete Spring™ Column Hardware Kits

Column Dimensions	Part No.	Description	Includes:	Part No.
<i>25mm i.d.</i>				
25mm i.d. x 40cm, Non-Water-Jacketed	SA2002-025040	Base Column Parts Kit*, 40cm long column, for bed lengths up to 15cm		<b>SC2002-025040</b>
	AS2002-025A09	Piston Assembly with 2µm frit		
	AF0000-C02502	Outlet Frit, 2µm		
	AS2002-025A03	Spring Kit for packing pressures from 1000 to 2000psig		
25mm i.d. x 70cm, Non-Water-Jacketed	SA2002-025070	Base Column Parts Kit*, 70cm long column, for bed lengths up to 30cm		<b>SC2002-025070</b>
	AS2002-025A09	Piston Assembly with 2µm frit		
	AF0000-C02502	Outlet Frit, 2µm		
	AS2002-025A03	Spring Kit for packing pressures from 1000 to 2000psig		
<i>50mm i.d.</i>				
50mm i.d. x 40cm, Non-Water-Jacketed**	SA2002-050040	Base Column Parts Kit*, 40cm long column, for bed lengths up to 15cm		<b>SC2002-050040</b>
	AS2002-050A01	Piston Assembly with 2µm frit		
	AF0000-B05002	Outlet Frit, 2µm		
	AS2002-050A03	Spring Kit for packing pressures from 1000 to 2000psig		
50mm i.d. x 70cm, Non-Water-Jacketed**	SA2002-050070	Base Column Parts Kit*, 70cm long column, for bed lengths up to 30cm		<b>SC2002-050070</b>
	AS2002-050A01	Piston Assembly with 2µm frit		
	AF0000-B05002	Outlet Frit, 2µm		
	AS2002-050A03	Spring Kit for packing pressures from 1000 to 2000psig		
<i>101mm i.d.</i>				
101mm i.d. x 40cm, Water-Jacketed	SA4004-101040	Base Column Parts Kit*, 40cm long column, for bed lengths up to 15cm		<b>SC4004-101040</b>
	2 x AS4004-101A06	Piston Assembly with 2µm frit		
	AS4004-101A03	Spring Kit for packing pressures up to 2000psig		
	AS2002-050A08	1/8" o.d., 0.060" i.d. Connecting Tube and Fittings		
101mm i.d. x 70cm, Water-Jacketed	SA4004-101070	Base Column Parts Kit*, 70cm long column, for bed lengths up to 30cm		<b>SC4004-101070</b>
	2 x AS4004-101A06	Piston Assembly with 2µm frit		
	AS4004-101A03	Spring Kit for packing pressures up to 2000psig		
	AS2002-050A08s	1/8" o.d., 0.060" i.d. Connecting Tube and Fittings		

**NOTE:**

Spring™ Column units are designed to be easily serviceable. A full array of components and replacement parts are available. Please consult the listings on the following two pages as well as the column manuals for details.

\*See page 162 for listing of components included in Base Column Parts Kit.

\*\*Two sizes of connecting tubing provided.



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# Spring™ Column Hardware

## Spring™ Column Components

Experienced Spring™ Column users can build customized Spring™ Column units by individually selecting the components that best meet their needs. A total of five components is needed to assemble a complete Spring™ Column.

### Spring™ Column Units

Column Dimensions	Description	Part No.
<i>25mm i.d.</i>		
1. Base Parts Kit	Non-Water-Jacketed Kit, 40cm long, for bed lengths up to 15cm	SA2002-025040
	Water-Jacketed Kit, 40cm long, for bed lengths up to 15cm	SA2002-W25040
	Non-Water-Jacketed Kit, 70cm long, for bed lengths up to 30cm	SA2002-025070
	Water-Jacketed Kit, 70cm long, for bed lengths up to 30cm	SA2002-W25070
2. Piston Assembly	Piston Assembly with 1µm frit	AS2002-025A01
	Piston Assembly with 2µm frit	AS2002-025A09
	Piston Assembly with 5µm frit	AS2002-025A02
3. Spring Kit	Spring Kit for packing pressures from 1000 to 2000psig	AS2002-025A03
	Spring Kit for packing pressures from 500 to 900psig	AS2002-025A04
	Spring Kit for packing pressures up to 400psig	AS2002-025A05
4. Outlet Frit	Outlet Frit, 1µm	AF0000-C02501
	Outlet Frit, 2µm	AF0000-C02502
	Outlet Frit, 5µm	AF0000-C02503
5. Tubing and Connectors	1/16" o.d., 0.020" i.d. Connecting Tube and Fittings	AS2002-025A06
	1/16" o.d., 0.040" i.d. Connecting Tube and Fittings	AS2002-025A07
<i>50mm i.d.</i>		
1. Base Parts Kit	Non-Water-Jacketed Kit, 40cm long, for bed lengths up to 15cm	SA2002-050040
	Water-Jacketed Kit, 40cm long, for bed lengths up to 15cm	SA2002-W50040
	Non-Water-Jacketed Kit, 70cm long, for bed lengths up to 30cm	SA2002-050070
	Water-Jacketed Kit, 70cm long, for bed lengths up to 30cm	SA2002-W50070
2. Piston Assembly	Piston Assembly with 1µm frit	AS2002-050A01
	Piston Assembly with 2µm frit	AS2002-050A11
	Piston Assembly with 5µm frit	AS2002-050A02
3. Spring Kit	Spring Kit for packing pressures from 1000 to 2000psig	AS2002-050A03
	Spring Kit for packing pressures from 500 to 900psig	AS2002-050A05
	Spring Kit for packing pressures up to 400psig	AS2002-050A06
4. Outlet Frit	Outlet Frit, 1µm	AF0000-B05001
	Outlet Frit, 2µm	AF0000-B05002
	Outlet Frit, 5µm	AF0000-B05003
5. Tubing and Connectors	1/16" o.d., 0.040" i.d. Connecting Tube and Fittings	AS2002-050A07
	1/8" o.d., 0.060" i.d. Connecting Tube and Fittings	AS2002-050A08
	1/8" o.d., 0.085" i.d. Connecting Tube and Fittings	AS2002-050A09
<i>101mm i.d.</i>		
1. Base Parts Kit	Non-Water-Jacketed Kit, 40cm long, for bed lengths up to 15cm	SA4004-N10140
	Water-Jacketed Kit, 40cm long, for bed lengths up to 15cm	SA4004-101040
	Non-Water-Jacketed Kit, 70cm long, for bed lengths up to 30cm	SA4004-N10170
	Water-Jacketed Kit, 70cm long, for bed lengths up to 30cm	SA4004-101070
2. Piston Assembly (Need Qty. 2)	Piston Assembly with 1µm frit	AS4004-101A01
	Piston Assembly with 2µm frit	AS4004-101A06
	Piston Assembly with 5µm frit	AS4004-101A02
3. Spring Kit	Spring Kit for packing pressures from 1000 to 2000psig	AS4004-101A03
	Spring Kit for packing pressures from 500 to 900psig	AS4004-101A04
	Spring Kit for packing pressures up to 400psig	AS4004-101A05
4. Tubing and Connectors	1/8" o.d., 0.060" i.d. Connecting Tube and Fittings	AS2002-050A08
	1/8" o.d., 0.085" i.d. Connecting Tube and Fittings	AS2002-050A09

### more info

For a listing of the individual parts included in the kits and assemblies above, please refer to page 162.

### tech tip

Selecting the correct frit porosity ensures particles are retained in the column while contributing minimally to backpressure. See the recommendation below.

Particle Size	Recommended Frit Porosity
<5µm	1µm
5–10µm	2µm
>10µm	5µm

# Spring™ Column Hardware

## Repack Kits for Spring™ Columns

Popular frit porosities, 2µm and 5µm, are available bundled with the appropriate replacement consumables needed when repacking. 1µm frits are available below in the replacement parts list.

The 25 and 50mm i.d. repack kits contain consumable parts for three repacks. The 101mm i.d. repack kits contain parts for one repack.

### Repack Kits for Spring™ Column Modules

Column Dimensions	Qty.	Part No.	Includes: Description	Part No.
<i>25mm i.d.</i>				
With 2µm Frits	3	AF0000-C02502	Outlet Frit, 2µm	AS2002-025A16
	3	AH0000-R025A1	Outlet O-ring Set	
	3	AF0000-D02501	Outlet Disperser Frit	
	3	AS2002-025A14	Piston Frit Replacement Kit*, 2µm	
With 5µm Frits	3	AF0000-C02503	Outlet Frit, 5µm	AS2002-025A17
	3	AH0000-R025A1	Outlet O-ring Set	
	3	AF0000-D02501	Outlet Disperser Frit	
	3	AS2002-025A13	Piston Frit Replacement Kit*, 5µm	
<i>50mm i.d.</i>				
With 2µm Frits	3	AF0000-B05002	Outlet Frit, 2µm	AS2002-050A18
	3	AH0000-R050A1	Outlet O-ring Set	
	3	AF0000-D05001	Outlet Disperser Frit	
	3	AS2002-050A16	Piston Frit Replacement Kit*, 2µm	
With 5µm Frits	3	AF0000-B05003	Outlet Frit, 5µm	AS2002-050A19
	3	AH0000-R050A1	Outlet O-ring Set	
	3	AF0000-D05001	Outlet Disperser Frit	
	3	AS2002-050A15	Piston Frit Replacement Kit*, 5µm	
<i>101mm i.d.</i>				
With 2µm Frits	2	AS4004-101A18	Piston Frit Replacement Kit*, 2µm	AS4004-101A20
	2	AS4004-101011	Piston O-ring	
	2	AS4004-101012	PTFE Sleeve	
With 5µm Frits	2	AS4004-101A17	Piston Frit Replacement Kit*, 5µm	AS4004-101A21
	2	AS4004-101011	Piston O-ring	
	2	AS4004-101012	PTFE Sleeve	

\*Components of the Piston Frit Replacement Kit are listed below.

## Replacement Parts for Spring™ Columns

In addition to the repack kits listed above, a full array of individual component replacement parts may be ordered from the list below.

### Spring™ Column Replacement Parts

Description	For 25mm i.d.	For 50mm i.d.	For 101mm i.d.
Top Restraint	—	—	AS4004-101008
Bottom Restraint	—	—	AS4004-101009
Piston Top	—	—	AS4004-101010
Piston O-ring	AS2002-025011	AS2002-050011	AS4004-101011
Guide Tube	AS2002-025013	AS2002-050013	AS4004-101013
Column Body, 40 cm Long Non-Water-Jacketed	FS2002-025040	FS2002-050040	AS4004-N10140
Column Body, 70 cm Long Non-Water-Jacketed	FS2002-025070	FS2002-050070	AS4004-N10170
Column Body, 40 cm Long Water-Jacketed	FS2002-W25040	FS2002-W50040	AS4004-101040
Column Body, 70 cm Long Water-Jacketed	FS2002-W25070	FS2002-W50070	AS4004-101070
Outlet Disperser Frit	AF0000-D02501	AF0000-D05001	—
Outlet Frit, 1µm	AF0000-C02501	AF0000-B05001	—
Outlet Frit, 2µm	AF0000-C02502	AF0000-B05002	—
Outlet Frit, 5µm	AF0000-C02503	AF0000-B05003	—
Outlet O-ring Set	AH0000-R025A1	AH0000-R050A1	—
Replacement Bolts, Nuts, and Washers for Non-Water-Jacketed Column	AS2002-025A08	AS2002-050A10	—
Replacement Bolts, Nuts, and Washers for Water-Jacketed Column	AS2002-025A11	AS2002-050A13	—
Threaded Spacer for 40cm Long Column	AS2002-025000	AS2002-050000	AS4004-101000
Threaded Spacer for 70cm Long Column	AS2002-025001	AS2002-050001	AS4004-101001
Threaded Flange	AS2002-025002	AS2002-050002	AS4004-101002
Packing Spacer	AS2002-025003	AS2002-050003	AS4004-101003
Unpacking Spacer for 40cm Long Columns	AS2002-025004	AS2002-050004	AS4004-101004
Unpacking Spacer for 70cm Long Columns	AS2002-025005	AS2002-050005	AS4004-101005
Piston	AS2002-025007	AS2002-050007	AS4004-101007
Piston Frit Replacement Kit (Piston O-ring, 1µm Double Density Frit, PTFE Sleeve), 1µm	AS2002-025A12	AS2002-050A14	AS4004-101A16
Piston Frit Replacement Kit (Piston O-ring, 2µm Double Density Frit, PTFE Sleeve), 2µm	AS2002-025A14	AS2002-050A16	AS4004-101A18
Piston Frit Replacement Kit (Piston O-ring, 5µm Double Density Frit, PTFE Sleeve), 5µm	AS2002-025A13	AS2002-050A15	AS4004-101A17
PTFE Sleeve	AS2002-025010	AS2002-050010	AS4004-101012

# Axial SFC Column Hardware

For Use with Multipacker® Packing Instruments



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- High efficiency packing mechanism
- Rated to 5000psig for SFC
- Easily packed by end-user with Multipacker® instrument

Grace Axial SFC Columns are design-related to Spring™ Column axial compression columns. They are packed with the same, easy-to-use Multipacker® packing systems but are designed with the requirements of supercritical fluid chromatography in mind. Custom seals, suitable for use with supercritical CO<sub>2</sub> at pressures up to 5000psig, are manufactured specially for Grace. The axial compression packing mode is still employed. However, the internal spring axial compression has been omitted because of the high pressures typical in SFC systems and the low viscosity of the mobile phase, which makes void formation less likely.

Axial SFC Column Hardware Specifications	
<b>Wet Surfaces:</b>	Electropolished Type 316 Stainless Steel, PTFE
<b>Column Body:</b>	Electropolished Type 316 Stainless Steel
<b>Piston:</b>	Electropolished Type 316 Stainless Steel
<b>Threaded Spacer:</b>	Type 6061 Aluminum
<b>Endplate:</b>	Electropolished Type 316 Stainless Steel
<b>Bolting Hardware:</b>	Grade 8, qualified for pressure vessels
<b>Frits:</b>	Passivated Sintered Type 316 Stainless Steel
<b>O-ring Seals:</b>	PTFE
<b>Lip Seals:</b>	Turcon®
<b>Backup Ring:</b>	Bronze
<b>Pressure Rating:</b>	5000psig (345 bar)
<b>Max. Temperature:</b>	135°C (275°F)

## Rugged SFC Sealing System

The sealing materials for axial SFC columns have been chosen for their compatibility with modified supercritical carbon dioxide typically employed in SFC systems. The seal system is rated for continuous operation at pressures of up to 5000psig (345 bar).

### Piston

A pure PTFE O-ring primary seal and a Turcon® spring-loaded lip secondary seal comprise the sealing mechanism for the piston.



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### Column Outlet

The column outlet seals system is composed of a Turcon® spring-loaded lip seal and a bronze backup ring.



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## related products

Refer to page 172 for more information on the Multipacker® packing stations used to pack Axial SFC column hardware.



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# Axial SFC Column Hardware

## Complete Axial SFC Column Hardware Kits

Complete hardware kits are available under single catalog numbers for standard 25mm i.d. and 50mm i.d. water-jacketed axial SFC columns, as shown below. Individual components and replacement parts are listed on the following two pages.

Column Dimensions	Part No.	Description	Includes:	Part No.
<i>25mm i.d.</i>				
25mm i.d. x 40cm, Water-Jacketed	AY2002-W25040	Base Column Parts Kit*, 40cm long column, for bed lengths up to 15cm		<b>SY2002-W25040</b>
	AY2002-025A01	Piston Assembly with 1µm frit		
	AF0000-C02501	Outlet Frit, 1µm		
	AS2002-025A07	1/16" o.d., 0.020" i.d. Connecting Tube and Fittings		
25mm i.d. x 70cm, Water-Jacketed	AY2002-W25070	Base Column Parts Kit*, 70cm long column, for bed lengths up to 30cm		<b>SY2002-W25070</b>
	AY2002-025A01	Piston Assembly with 1µm frit		
	AF0000-C02501	Outlet Frit, 1µm		
	AS2002-025A07	1/16" o.d., 0.020" i.d. Connecting Tube and Fittings		
<i>50mm i.d.</i>				
50mm i.d. x 40cm, Water-Jacketed	AY2002-W50040	Base Column Parts Kit*, 40cm long column, for bed lengths up to 15cm		<b>SY2002-W50040</b>
	AY2002-050A01	Piston Assembly with 1µm frit		
	AF0000-B05001	Outlet Frit, 1µm		
	AS2002-050A07	1/8" o.d., 0.060" i.d. Connecting Tube and Fittings		
50mm i.d. x 70cm, Water-Jacketed	AY2002-W50070	Base Column Parts Kit*, 70cm long column, for bed lengths up to 30cm		<b>SY2002-W50070</b>
	AY2002-050A01	Piston Assembly with 1µm frit		
	AF0000-B05001	Outlet Frit, 1µm		
	AS2002-050A07	1/8" o.d., 0.060" i.d. Connecting Tube and Fittings		

\*See page 162 for listing of components included in Base Column Parts Kit.

### more info

#### Supercritical Fluid Chromatography (SFC)

Supercritical fluids, first discovered in 1879, have been used for extraction applications since the 1950s. The 1980s saw an increase in their use as mobile phases for supercritical fluid chromatography (SFC). The mobile phase most commonly used in SFC is supercritical CO<sub>2</sub>.

Supercritical CO<sub>2</sub> as a mobile phase provides high solubility and high column loading for many substances. In addition, CO<sub>2</sub> and other supercritical fluids have very low viscosity which enables faster separations and extractions. Collection of concentrated product is also facilitated by the ready evaporation of the mobile phase under ambient conditions.

SFC today is just another type of high-performance chromatography, either normal or reversed phase, ideally suited for the analysis of thermally labile molecules with low or moderate molecular weight.

Any molecule that will dissolve in methanol or a less polar solvent is a good candidate for SFC. Many strong bases that are difficult to separate by other techniques separate rapidly and efficiently with good peak shape in SFC.

This technique in recent times has attracted new applications in drug discovery and drug purification because of its speed of separation and simplicity of fraction collection.

SFC requires columns with hardware and seals designed to withstand higher operating pressures. Grace's Axial SFC columns are designed to meet these requirements and offer in addition the advantage of a long-life column prepared using proven axial compression packing techniques.

### technical assistance

Contact Tech Support: Phone: 1.800.255.8324 (North America)

Email: [contact.alltech@grace.com](mailto:contact.alltech@grace.com)

Online: [www.discoverysciences.com](http://www.discoverysciences.com)

# Axial SFC Column Components

## How to Order Axial SFC Columns

Axial SFC columns can be ordered as a complete kit, as seen on page 167, or customized selecting the options that best suit your needs, as shown below. Axial SFC columns are offered in two lengths, 40cm and 70cm. A 40cm column body can accommodate up to a 15cm length packed bed and the 70cm column body can accommodate up to a 30cm length packed bed.

Each complete column consists of four components:

1. The Base Spring™ Column Parts Kit includes:
  - a. Column Body Axial SFC
  - b. All Seals and O-rings
  - c. Locking Mechanism
  - d. Guide Tube
  - e. Endplate
  - f. Assembly Hardware
  - g. Packing Spacers (for 70cm length columns)
2. A Ready-to-Use Piston Assembly consisting of the piston body, piston frit, PTFE sleeve, and piston seal. The piston assembly can be ordered with a 1µm or 5µm frit porosity.
3. An Outlet Frit. Choose 1µm or 5µm frit porosity.
4. Tubing and Connectors. Choose tubing with an outer diameter and bore that suits your needs.



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Experienced Axial SFC Column users can build customized Axial SFC Columns by individually selecting the components that best meet their needs.

### Axial SFC Columns

Column Dimensions	Description	Part No.
<i>25mm i.d.</i>		
1. Base Parts Kit	Non-Water-Jacketed Axial SFC Column Kit, 40cm long, for bed lengths up to 15cm	AY2002-025040
	Water-Jacketed Axial SFC Column Kit, 40cm long, for bed lengths up to 15cm	AY2002-W25040
	Non-Water-Jacketed Axial SFC Column Kit, 70cm long, for bed lengths up to 30cm	AY2002-025070
	Water-Jacketed Axial SFC Column Kit, 70cm long, for bed lengths up to 30cm	AY2002-W25070
2. Piston Assembly	Piston Assembly with 1µm frit	AY2002-025A01
	Piston Assembly with 5µm frit	AY2002-025A02
3. Outlet Frit	Outlet Frit, 1µm	AF0000-C02501
	Outlet Frit, 5µm	AF0000-C02503
4. Tubing and Connectors	1/16" o.d., 0.020" i.d. Connecting Tube and Fittings	AF2002-025A06
	1/16" o.d., 0.040" i.d. Connecting Tube and Fittings	AF2002-025A07
<i>50mm i.d.</i>		
1. Base Parts Kit	Non-Water-Jacketed Axial SFC Column Kit, 40cm long, for bed lengths up to 15cm	AY2002-050040
	Water-Jacketed Axial SFC Column Kit, 40cm long, for bed lengths up to 15cm	AY2002-W50040
	Non-Water-Jacketed Axial SFC Column Kit, 70cm long, for bed lengths up to 30cm	AY2002-050070
	Water-Jacketed Axial SFC Column Kit, 70cm long, for bed lengths up to 30cm	AY2002-W50070
2. Piston Assembly	Piston Assembly with 1µm frit	AY2002-050A01
	Piston Assembly with 5µm frit	AY2002-050A02
3. Outlet Frit	Outlet Frit, 1µm	AF0000-B05001
	Outlet Frit, 5µm	AF0000-B05003
4. Tubing and Connectors	1/16" o.d., 0.040" i.d. Connecting Tube and Fittings	AF2002-050A07
	1/8" o.d., 0.060" i.d. Connecting Tube and Fittings	AF2002-050A08
	1/8" o.d., 0.085" i.d. Connecting Tube and Fittings	AF2002-050A09

### more info

For a listing of the individual parts included in the kits and assemblies above, please refer to page 166.

# Axial SFC Column Components

## Repack Kits for Axial SFC Columns

Each repack kit contains consumable parts for one column repack.

### Repack Kit for Spring™ Columns

Column Dimensions	Part No.	Description	Includes:	Part No.
<i>25mm i.d.</i>				
With 1µm Frits	AF0000-C02501	Outlet Frit, 1µm		AY2002-025A14
	AH0000-R025A2	Seal Ring Set for Axial SFC Column Outlet		
	AF0000-D02501	Outlet Disperser Frit		
	AY2002-025A12	Piston Frit Replacement Kit*, 1µm		
With 5µm Frits	AF0000-C02503	Outlet Frit, 5µm		AY2002-025A15
	AF0000-D02501	Outlet Disperser Frit		
	AH0000-R025A2	Seal Ring Set for Axial SFC Column Outlet		
	AY2002-025A13	Piston Frit Replacement Kit*, 5µm		
<i>50mm i.d.</i>				
With 1µm Frits	AF0000-B05001	Outlet Frit, 1µm		AY2002-050A12
	AH0000-R050A2	Seal Ring Set for Axial SFC Column Outlet		
	AF0000-D05001	Outlet Disperser Frit		
	AY2002-050A14	Piston Frit Replacement Kit*, 1µm		
With 5µm Frits	AF0000-B05003	Outlet Frit, 5µm		AY2002-025A15
	AF0000-D05001	Outlet Disperser Frit		
	AH0000-R050A2	Seal Ring Set for Axial SFC Column Outlet		
	AY2002-050A15	Piston Frit Replacement Kit*, 5µm		

\*Components of the Piston Frit Replacement Kit are listed below.

## Replacement Parts for Axial SFC Columns

In addition to the repack kits listed above, a full array of replacement parts may be ordered from the list below.

### Spring™ Column Replacement Parts

Description	For 25mm i.d.	For 50mm i.d.
Outlet Disperser Frit	AF0000-D02501	AF0000-D05001
Outlet Frit, 1µm	AF0000-C02501	AF0000-B05001
Outlet Frit, 5µm	AF0000-C02503	AF0000-B05003
Seal Ring Set for Axial SFC Column Outlet	AH0000-R025A2	AH0000-R050A2
Replacement Bolts, Nuts, and Washers for Non-Water-Jacketed Column	AY2002-025A08	AY2002-050A10
Replacement Bolts, Nuts, and Washers for Water-Jacketed Column	AY2002-025A11	AY2002-050A13
Threaded Spacer for 40cm Long Column	AS2002-025000	AS2002-050000
Threaded Spacer for 70cm Long Column	AS2002-025001	AS2002-050001
Threaded Flange	AS2002-025002	AS2002-050002
Packing Spacer	AS2002-025003	AS2002-050003
Unpacking Spacer for 70cm Long Columns	AS2002-025005	AS2002-050005
Piston	AY2002-025007	AY2002-050007
Piston Frit Replacement Kit, 1µm; Piston O-ring, spring-loaded seal, PTFE sleeve, 1µm Double-Density Frit	AY2002-025A12	AY2002-050A14
Piston Frit Replacement Kit, 5µm; Piston O-ring, spring-loaded seal, PTFE sleeve, 5µm Double-Density Frit	AY2002-025A13	AY2002-050A15
Piston Seal for Axial SFC Column	AY2002-025011	AY2002-050011
PTFE Sleeve	AS2002-025010	AS2002-050010



# Empty MODcol® Flanged Columns

- Robust 316 stainless steel construction
- Double seals prevent leaks
- Novel flow distribution ensures high chromatographic performance

Modular in construction and manufactured to the highest standards, these patented stainless steel columns are known for durability and their special leakproof seal system. A uniform approach to the design of MODcol® column components is used across the MODcol® preparative, semi-preparative and industrial column product lines.

All MODcol® flanged columns are constructed from high-quality 316 stainless steel alloy and electro-polished to provide the highest possible corrosion protection and chemical inertness. The flanged construction is rugged and conservatively rated at 2000psig. Column closure is achieved with high-strength bolts and heavy-duty endplates that are engineered to provide long product life. The simplicity of this design, without threads or other parts that can wear out, makes the hardware reusable and repackable.

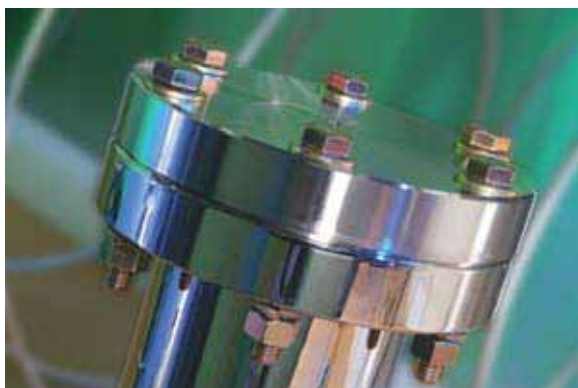
Each empty column kit comes with the following:

- One column body
- One pair of end plates
- Frits, o-rings, and tubing connectors

### related products

Custom packing of MODcol® Flanged Columns is available. Refer to page 174.

Sizes other than those listed are available on a custom basis. Please contact Grace for assistance.



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### Empty MODcol® Flanged Column Kits (Complete)

i.d.	Length					
	5cm Part No.	10cm Part No.	15cm Part No.	25cm Part No.	30cm Part No.	50cm Part No.
25mm	FA0000-025005	FA0000-025010	FA0000-025015	FA0000-025025	C	C
30mm	FA0000-030005	FA0000-030010	FA0000-030015	FA0000-030025	C	C
50mm	FA0000-050005	FA0000-050010	FA0000-050015	FA0000-050025	FA0000-050030	FA0000-050050
101mm	—	FA0000-101010	FA0000-101015	FA0000-101025	FA0000-101030	FA0000-101050

C = available as a custom order.

### Parts for MODcol® Flanged Columns

i.d.	Assembly Hardware Part No.	Seal Rings/O-Rings (set) Part No.	Disperser Frits (pair) Part No.	Bed-Support Frits (pair)* Part No.
25mm	AH0000-A02501	AH0000-R025A1	AF0000-D025A1	AF0000-B025Ax
30mm	AH0000-A03001	AH0000-R030A1	AF0000-D030A1	AF0000-B030Ax
50mm	AH0000-A05001	AH0000-R050A1	AF0000-D050A1	AF0000-B050Ax
101mm	AH0000-A10101	AH0000-R101A1	AF0000-D101A1	AF0000-B101Ax

\*When specifying the part number for flanged column frits, please indicate the desired porosity by substituting the trailing "x" with: "1" for 1µm, "2" for 2µm, "3" for 5µm, "4" for 10µm.

### MODcol® Mobile Column Stand, Holder, and Tray

i.d.	Part No.
101mm	A00000-101000

### Stainless Steel Tubing, Fittings, and Connectors

Description	Part No.
1/16" o.d., 0.020" i.d. Connecting Tube and Fittings*	AS2002-025A06
1/16" o.d., 0.040" i.d. Connecting Tube and Fittings*	AS2002-025A07
1/8" o.d., 0.060" i.d. Connecting Tube and Fittings**	AS2002-050A08
1/8" o.d., 0.085" i.d. Connecting Tube and Fittings**	AS2002-050A09

\*1 union, 1 nut, 1 ferrule, and 2 plugs. Compatible with flanged and spring columns up to 25mm i.d.

\*\*1 union, 1 nut, 1 ferrule, 2 plugs, and 2 female reducers 1/8" to 1/16." Compatible with flanged and spring columns of 30mm i.d. and greater.

# Process Scale Columns and Systems by Peak Biotech A/S

Grace is a global distributor of Peak Biotech A/S columns and systems. This partnership with Peak extends Grace's column line to provide customers a completely scalable solution, from pre-packed prep columns to bulk chromatography adsorbents and process scale columns and systems. The coordination between bulk media and process column manufacturer reduces scale-up risk. Peak's products are of the highest quality, and are trusted throughout the pharmaceutical and biotech industry.

## Dynamic Axial Compression Columns: 50–1000mm i.d.

### Features:

- Easy packing and unpacking
- Uniform distribution system
- Removable frit design for easy cleaning or replacement
- High performance and reproducibility
- Leak detection system
- No sealing adjustment needed
- Scalable
- Mobile construction up to 300mm
- Ergonomic working positions



### Column Specifications:

<b>Diameters:</b>	From 50–1000mm
<b>Pressure Rated:</b>	To 100 bar
<b>Sealing Materials:</b>	PTFE and PEEK
<b>Material of Construction:</b>	1.4404, 1.4435, SS316L, SAF2205
<b>Construction Code:</b>	PED or ASME

## High-Pressure Chromatography Systems

### Features:

- Gradient performance with high accuracy
- Fully automated, CFR Part 11 and GAMP 4 compliant
- Mobile construction
- Complete unit, tested and documented
- Compact and reliable
- Flexible control
- Easy maintenance
- Sanitary design



### System Specifications:

<b>Flow Rates:</b>	6–5000L/h for medium pressure
<b>Flow Rates:</b>	6–1000L/h for high pressure
<b>Pressure Rating:</b>	0–20 bar and 0–80 bar
<b>Gradient Loop:</b>	Feedback for NIR, mass or conductivity
<b>Inlets:</b>	4 buffer inlets, 1 product and 5 fractions
<b>Sealing Material:</b>	PTFE
<b>Material of Construction:</b>	1.4404, 1.4435, SS316L

## Software Control

### Features:

- Based on Siemens™ PCS 7
- Fully automated
- CFR Part 11 compliant
- GAMP 4 compliant
- Programmed according to S88 standard
- Fully tested and validated
- Flexible control



## ordering information

Contact your Grace sales representative or customer service to review the column and system options and custom build your Peak Biotech system.

## related products

Also available from Peak Biotech:

- Slurry Handling Equipment
- Ultra-sonic Baths
- Buffer Systems
- Tanks
- Flanged Columns / mech. compress columns
- Low and medium pressure columns
- Low and medium pressure systems

## Multipacker® Packing Stations

- Axial packing for high efficiency
- Identical, high performing columns every time
- Easy to use
- Pack multiple columns on demand
- Economically priced

Multipacker® instruments are easy-to-use high-performance packing stations specifically designed for packing Spring™ Columns. Three separate instruments are available for packing 25mm i.d., 50mm i.d., and 101mm i.d. columns. Their ease of operation and short cycle times provide a self-contained versatile column-packing solution.

Spring™ Column hardware offers outstanding convenience and flexibility when used with Multipacker® instruments. The ability to vary bed length continuously up to 30cm and the advantages of the Spring-driven axial compression mechanism provide a high-performance adaptive solution for both product development and process chromatography. Furthermore, compared to traditional column packing processes, Spring™ Column packing requires significantly less adsorbent per column because the bed is formed from the entire quantity of adsorbent introduced into the column, without wastage. More columns can be packed from the same batch of medium, reducing concerns about lot-to-lot variations. Also, because adsorbent requirements are reduced, the cost of a Multipacker® instrument is recovered quickly.

Once packed, Spring™ Column units are independent and maintain axial compression when used separately from the Multipacker® instrument. Consequently, one Multipacker® instrument can be used to maintain an entire fleet of Spring™ Column modules. For the first time, chromatographers have the ability to pack columns on demand and quickly respond to in-house column needs.

Multipacker® instruments provide several unique advantages. You have the ability to pack columns when and where they are needed. You save money with every column packed and less adsorbent is required. You have control of bed length and column volume, and columns can easily be unpacked, with recovery of adsorbent, and repacked in a matter of minutes.

A Multipacker® axial-compression system is able to pack columns at low pressures, so less robust media can be protected from damage and their performance preserved. Reduced mechanical damage to adsorbent with a Multipacker® instrument makes it the perfect match for delicate, non-silica-based media.

Unlike column-packing systems that use awkward hand pumps and can require hours for column packing, Spring™ Column packing takes only minutes and operates with the push of a button. Multipacker® instruments use modular construction that makes them lightweight and easily assembled or disassembled. Key components are produced using advanced aluminum casting techniques that reduce manufacturing costs and provide high strength and reliability.



25 and 50mm i.d. Multipacker® Instruments.

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### technical assistance

Contact Tech Support: Phone: 1.800.255.8324 (North America)  
 Email: [contact.alltech@grace.com](mailto:contact.alltech@grace.com)  
 Online: [www.discoverysciences.com](http://www.discoverysciences.com)

### related products

Refer to pages 162–169 for more information on Spring™ Columns for use with Multipacker® packing stations.



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# Multipacker® Packing Stations

The World's Most Innovative Preparative Column Packing System

**Multipacker® Series 2002 Instrument for 25mm i.d. Spring™ Column Modules**

Part No.  
**IM2002-025IM1**

**Multipacker® Series 2002 Instrument for 50mm i.d. Spring™ Column Modules**

Part No.  
**IM2002-050IM1**

**Multipacker® Series 2002 Two-Instrument Bundle for 25mm i.d. and 50mm i.d. Spring™ Column Modules**

Part No.  
**IM2002-025050**

**Multipacker® Instrument for 101mm i.d. Spring™ Column Modules**

Part No.  
**IM2002-101IM1**

**more info**

For a short web animation and video demonstration, visit the MODcol® section of our website at [www.discoverysciences.com/modcol](http://www.discoverysciences.com/modcol).

**related products**

Multipacker® instruments require Spring™ Column hardware, purchased separately, for column packing. See listing on pages 162–169.



101mm  
Multipacker®  
Instrument.

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